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FOREST INSECT INVESTIGATIONS

FOREST INSECT CONDITIONS WITHIN THE GLACIER NATIONAL PARK WITH RECOMMENDATIONS FOR CONTROL 1931

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INTRODUCTION

Though the substance of this report has been previously discussed with National Park officials, through informal letters, conferences, etc., it seems advisable to follow our past practice and bring this scattered information together. In this way a complete report depicting the past season's activity, as well as the present status of existing conditions, with recommendations for control, will be available to those interested. To complete such a report, it has been necessary to include brief accounts of control work conducted in 1930, and 1931, and previously reported by Glacier Park officers. An attempt has been made to keep this report as brief as possible, including only such data as believed necessary. A discussion of the different insect situations follows.

McDONALD-MINERAL CREEK PROJECT

Control measures were instituted in this somewhat isolated area in May, 1930. At that time 363 white pine trees, infested with the mountain pine beetle, were treated at a cost of $1,573.36, or $4.33 per tree. During the summer of 1930 this area was very thoroughly examined, and the work considered as being successful. From this examination it was estimated that there were some 25-35

infested white pine requiring treatment in the spring of 1931.

Control measures were again instituted in 1931 and 42 white pine treated within the area covered in 1930. However, the operation was extended into an area of lodgepole where an additional 97 trees were treated. The work was again very thoroughly and efficiently performed, though there was some infested bark surface left untreated. An examination of this area in August, 1931, revealed by far too many infested trees. The source of this infestation is of course unknown. Some of the scattered infested trees could be accounted for by the presence of untreated bark surface adjacent; however, with the larger groups it was rather difficult to convince oneself that the attacking insects came from 1930 attacked trees missed during the operation.

Though it is possible that the unexpected 1931 infestation could have originated from untreated bark surface within the area, to the writer it seems rather doubtful. It is true that this area is somewhat isolated from other pine areas, and is perhaps protected by its location. However, it is evident that this reinfestation could have originated from the more heavily infested untreated areas to the west.

The value of future control within this area is questionable. Regardless of the source of the 1931 infestation, flights of insects into the area are entirely possible, so in all future plans of control this project must stand as in the past with no assurance or guarantee of success. A large per cent of the pine has already been destroyed by

an outbreak of this insect in 1912 and 1913, and the existing infestation has already taken an additional severe toll, so that there is not a great deal of pine remaining. It would seem that the decision as to the justification for the continuance of this project, which must be based upon the scenic value of the timber at stake, should rightfully rest with the Park Service. Though no attempt was made to accurately estimate the 1931 infestation within the area, one may be safe in saying that $1,000.00 should be set aside for control in 1932.

WISE LAKE - SPERRY TRAIL AREA

Control work against an outbreak of the mountain pine beetle was instituted in this area in May, 1930, in an attempt to protect the scenic values of the Sperry Glacier Trail. At that time 1,116 trees, mostly lodgepole pine, were treated at a cost of $2,405.00. Though the work in connection with this project was very thoroughly performed, an examination in August revealed the fact that on an area a trifle larger than that covered by control, there were 423 trees which had been attacked in 1930. The 1930 control operation had been thoroughly performed, and it was evident that a greater reduction should have been secured. To explain this unexpected 1930 infestation, it would seem very evident that a certain per cent of the attacks must have originated from beetles flying into the area from infested regions immediately adjacent.

In view of the scenic properties at stake, as well as the experimental values to be secured, it was again recommended that this

area be covered by control in 1931. At this time approximately 500 trees were treated in an area somewhat larger than that covered in 1930. However, an increased acreage was included on the west slope of Mt. Brown where, on 880 acres, an additional 970 trees were treated, a large per cent of them being lodgepole pine. An examination made in August, 1931, of the area along the Sperry Trail and around Fish Lake revealed only four newly attacked trees. Though this examination was very extensive, it would indicate that the control work of 1931 was rather satisfactory. However, in view of existing conditions, one may be rather sure that such a reduction will prove to be of a temporary nature only, and any success gained at this time will soon be lost by the reinfestation which is bound to occur. The pine stands on each side of the lake, especially those to the northwest, are badly infested with this insect and the chance of protecting any one small area in such a large region as the McDonald Lake Basin is very remote.

Though, of course, a final decision, relative to the institution of further control within these areas, must rest with the Park Service, when all factors of the serious existing condition are considered there would seem to be no justification for further expenditures of funds in connection with this project. Furthermore, the situation is not as serious as one may feel, for, as pine constituted but a minor portion of the timber stand within this area, the scenic values of the forest will not be fully destroyed. Not only can no assurance of success be offered, but one may feel rather sure that, even

if control is instituted and continued for a number of years as will be necessary, the remaining stand of pine will be seriously depleted before the sources of reinfestation, which border the area, are exhausted.

DOUGLAS FIR BEETLE CONTROL PROJECT

Though in 1930 there were Douglas Fir trees infested by the Douglas Fir beetle scattered throughout the McDonald Lake Basin, the infestation was concentrated in an area at the head of the lake. In the hopes that this infestation was of local origin, control measures were recommended for the fall of 1930 in an attempt to prevent further destruction. Though fully recognized that no assurance of success could be offered, as the source of the infestation was not known, in consideration of the scenic values at stake it was believed that the project was justified, even though the chances of success were very small. During this project 270 trees were treated on a rather small acreage. During the summer of 1931 this area was rather thoroughly examined and the work found to have been efficiently performed - no trees were missed and the treatment was very thorough indeed. However, in covering but a small per cent of the area 86 newly infested trees were located. These data indicate beyond all question that a large per cent of the 1931 infestation was caused by insects coming into the area from other infested regions.

The continuation of this project cannot be justified from any viewpoint, as not only can no assurance of success be given but the ultimate failure of the project is certain. Furthermore, as the timber

type within this area is of a mixed character, the removal of a large per cent of the Douglas fir will not seriously destroy the beauty of the region.

McDONALD LAKE BASIN

The three small projects previously discussed are all a part of this general McDonald Lake Basin, and were instituted for the purpose of protecting the scenic values of the entire drainage.

The forest on the west side of Glacier Park, and especially in the McDonald Lake Basin, are for the most part of a very mixed type; Douglas fir, larch, hemlock, alpine fir, spruce, and both lodgepole pine and white pine are found in various combinations and percentages. Further to the north there exists some rather large stands of lodgepole pine, though they occur in small to large patches, giving way to mixed forest types.

Throughout the entire west side of the park there exist two severe outbreaks of barkbeetles; the mountain pine beetle in both lodgepole pine and white pine, and the Douglas fir beetle in Douglas fir. The thoughts of instituting artificial control measures against these two outbreaks is prohibitive because the tremendous expense involved eliminates the taking of the very small chance of success which can be offered. A severe outbreak exists at this time along Howe Ridge, the northwestern border of this basin, which will unquestionably spread throughout the entire area, defeating the results of all control work instituted.

Though there is no question but that the loss of both the pine and Douglas fir from these forests will seriously detract from their beauty, it does not mean that their scenic values will be

completely destroyed. Even though these two outbreaks develop to their maximum severity and destroy all of the pine and Douglas fir within the area, the remaining tree species would produce sufficient green ground cover to retain, to a large extent, the scenic properties of the region. So after all, due to the mixed character of the timber type, these two outbreaks are not as serious as they would be in pure timber stands.

The institution of control for the protection of the McDonald Lake Basin would be an expensive undertaking, based upon an assurance that the operation would need be continued for a number of years, and that the chances of attaining success at the end of such a period of work would be very slight. Such a project would need be considered as a holding plan of control, calling for an annual cleanup of all infested trees within the basin, until such a time as the source of reinfestation, lying in the infested areas to the west and north, became exhausted. With a region so closely adjacent to such heavy potential centers of infestation, one could further be assured that by the time the source of supply became exhausted, a large per cent of the trees within the area, for which protection was desired, will be destroyed and very little, if anything, accomplished. Holding plans of control can only be justified when there is a catch basin between the source of supply and the area for which protection is desired, in which the trees are to be located and treated. Even when such favorable conditions exist, there is very little that can be said in favor of such a plan, either economically or entomological.

After carefully studying the proposed McDonald Lake Basin control project from the standpoint of balancing the expense involved

for control against the devastation which can be expected, with the uncertainty of success on the side of expense, the writer can see no justification for the institution of control. The seriousness of such a position is fully realized; however, the useless expenditure of public funds, based on the small chance of success that our past experiences with such infestations would seem to offer, is even more serious. The Glacier Park depends upon its forest as a setting to the splendors of its rugged mountain sides. When one considers the immeasurable value of such forests, the taking of even a small chance to protect them from insect depredations is often justified. However, when all of the factors contributing to this project are considered, there would seem to be no justification for the institution of control. The epidemics will not completely destroy the scenic values of these forests, and such losses as do occur might well be considered as being but one of nature's methods to eliminate the old and to provide room for young and thrifty growing trees.

EAST SIDE GLACIER NATIONAL PARK

During August, 1931, the writer made a very brief examination of some of the lodgepole areas on the east side of the Park. This examination revealed the fact that the mountain pine beetle was present in these forests, and that a more thorough investigation was necessary. Superintendent Scoyen detailed Ranger Harkins to make such an examination, and the results of his survey are presented in the following table.

TABLE SHOWING EAST SIDE AREAS COVERED BY SURVEY.
DATA SECURED BY PARK RANGER HARKINS

District	Acreage	Chains of Sample Strip	New Attacks per Acre of Strip	Estimated Number of New Attacks for Area
Cutbank	800	100	.20	160
Belly River	800	240	.12	96
Two Medicine	1300	400	.07	91
Sun Camp Reynolds Creek	600	210	.285	171
Sun Camp Mirror Pond	500	450	.155	77

The following notes are taken from Ranger Harkins' report and serve to depict the various conditions encountered during this survey.

The Many Glacier District has but little pine, with no old trees except scattered individuals throughout the camp ground and around Swift Current Lake. One tree was found with a pitched out attack.

Red Eagle Valley was found to contain comparatively young timber along the trail to Divide Mountain and to Red Eagle. No new attacks were found. A good many red topped balsam were found here as in all districts. The Balsams are dying out but consist of only one or two trees in a group.

Cutbank District has a nice stand of pine, but not old enough

for infestation. Two old mature trees were found with new attacks. The old trees are very scattered and nearly all on the south slope of the valley. No newly killed (prior to 1931) trees were found in this area. The timber is comparatively young and could not be considered as being susceptible to barkbeetle attack.

Belly River District is timbered with 50-60 year old reproduction with a scattering of old mature trees. Three newly attacked trees were found in a group; however, no trees were recorded that had been attacked in 1930. Oregon engraver beetles are attacking blow downs, but as a whole this district supports the cleanest stand of timber of all those examined.

Two Medicine District contains very little infestation. The timber consists of scattered old mature lodgepole pine and reproduction, with considerable balsam. Three newly attacked trees were found but no where in the area could trees attacked in 1930 be located, though there were trees attacked prior to this date to be seen.

Sun Camp District is forested with mature lodgepole pine, spruce and balsam. This area is the most heavily infested area on the east side of the Park. All the pine is mature and ideal beetle timber. This area would be susceptible to infestation from the McDonald Creek watershed.

SUMMARY OF EAST SIDE INFESTATION

It is true that the infestation as revealed by Ranger Harkins' survey could not be considered as being of serious importance at this time, and under most circumstances would be thought of as a normal or endemic

situation. However, in studying this situation, it must be born in mind that to the west of the mountains there exists a serious mountain pine beetle infestation, which in the next few years will undoubtedly increase in severity, and become a still greater potential source of infestation to adjacent areas. It is true that one cannot be sure as to the source of the infestation, which is now present within these east side forests. It is possible that it is but a local condition which has developed from a normal infestation within the area, or it could have originated by a flight of insects from the infested regions to the west. However, in view of the seriousness of other comparable situations, which have developed during the past few years, the situation on the East side of the Park must be viewed with alarm.

The success of control measures instituted within these east side forests depends almost entirely upon the source of the infestation. If local in origin, a **thorough treatment** of all the infested trees should show a very satisfactory result and eliminate the danger of a potential outbreak. On the other hand, a heavy reinfestation following the institution of such thorough control would rather definitely prove that insects were flying into the area. Should this fact be established the project would become a holding plan of control, calling for large expenditures of funds over a number of years, with the usual small chances of success offered by such projects. In order that the protection of these east side forests can be properly planned, the source of this infestation should be established as quickly, and as economically, as possible. Each year that this matter is delayed a greater expenditure of funds will be necessary to effect the thorough

clean-up of areas, which, as stated, will be necessary in order to establish this point. The writer therefore recommends that control measures be instituted in the spring of 1932 for the control of the mountain pine beetle in the Sun Camp and Cutbank Districts. On these two districts it has been estimated that there are some 408 trees infested at this time, and it is recommended that the sum of $1,000.00 be allotted for a thorough clean-up of these two areas. It is further recommended that, as the success of such a project depends entirely upon the thoroughness of the work, emphasis be placed upon quality of work, and that additional funds be provided if found necessary.

CONCLUSIONS

The task of the Bureau of Entomology is to assist Federal and private agencies in protecting their timber stands from the attacks of insects. Recommendations of Bureau officers, either for or against the institution of control, are but forecasts of insect activity, based upon their best judgment gleaned from past experiences. Often the task of making such recommendations is not a pleasant one. They often call for the expenditure of large sums of public moneys, or else death warrants are signed for specific timber stands. It is fully appreciated that some of the positions, as mentioned within this report, may not be fully understood, and the writer would be very pleased to explain in more detail any point not entirely clear. Furthermore, should the recommendations, as carried by this report, be disregarded and funds

secured for control within the areas mentioned, it is assured that every possible assistance will be given by this station in order to make the project a success, and to prove the writer's position in error.

Respectfully submitted,

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